

### REMARKS

Reconsideration and allowance of the current subject matter is respectfully requested.

No new matter has been added.

#### Rejections under 35 USC § 103

Claims 1-10 stand rejected under 35 USC § 103(a) as being unpatentable over Mao *et al.* (US Patent No. 6,728,704). These rejections are respectfully traversed.

Claim 1 has been amended to recite: “A method of executing an information retrieval query in a multiserver computing environment, the method comprising: requesting N unsorted results with an offset M from a first of a plurality of partial index servers in the multiserver computing environment, receiving the N unsorted results, the N unsorted results having keys  $K_1, \dots, K_N$ ; requesting N unsorted results from each other of the plurality of partial index servers, requesting M unsorted results from each other of the plurality of partial index servers, the request for the M unsorted results defining that each of the N unsorted results has the same keys  $K_j$  of the respective N unsorted results requested from the first of the plurality of partial index servers, and wherein  $(1 \leq j \leq N)$ ; calculating a subset of results for each of the plurality of partial index servers; and merging the subset of results in one logical index server to generate a merged result.” This amendment finds support, *inter alia*, in previous claim 4 and in FIG. 3 (item 304).

Mao describes an arrangement in which a query is transmitted to a set of search engines. Result lists returned from these search engines are received and a subset of entries in the result lists are selected. Each entry in this subset is assigned a scoring value according to a scoring function and each result list is then assigned a representative value according to the scoring values assigned to its entries. A merged list of entries is produced based upon the representative values assigned to each result list (see, Mao FIG. 2, *etc.*).

Mao fails to disclose or otherwise suggest that a first partial index server is queried and keys obtained from this first partial index server in the corresponding results are then used to form queries to other partial index servers so that the results are all based on a same set of keys as recited in claim 1.

Furthermore, Shirasaka relates to a data management system in which the number of times that data being managed by a server is transferred to allow for load balancing of mirror servers (see, *inter alia*, Shirasaka abstract). Shirasaka does not suggest the types of queries and the merging of results as recited in claim 1. Therefore, the skilled artisan would not have resulted in the claimed subject matter by combining Mao and Shirasaka. Moreover, the skilled artisan would not have even been motivated to combine the two references as Mao relates to the merging of results from multiple search engines, whereas Shirasaka relates to a data management system for determining which of a plurality of mirror servers (i.e., servers storing identical content) should be accessed for load balancing purposes.

Accordingly, claim 1 and its dependent claims should be allowable.

Claim 5 has been amended to recite: "A method of executing an information retrieval query in a multiserver computing environment, the method comprising: distributing the query among each of a plurality of partial index servers in the multiserver environment by: requesting N sorted results with an offset M from each of the plurality of partial index servers; merging C results from each of the plurality of partial index servers in one logical index server, wherein C is much greater than N and represents an upper bound on the number of results that needs to be considered in order to obtain the N results required, the value C being determined by: first determining a sum G of the Cth aggregate values for the plurality of partial index servers; and second determining a value H representing the (N+M)th aggregate value; and if  $G \geq H$ , resetting C to a new value; obtaining missing aggregate

values from each partial server that did not send particular keys using the new value of C to generate supplemental results; and merging the C results and the supplemental results by the logical index server.” (for support, see, *inter alia*, specification paragraphs 26-35, FIG. 5).

Mao describes an arrangement in which a subset of entries from result lists obtained from search engines are merged as opposed to the entire result lists (see, *inter alia*, Mao col. 5, lines 44-46). These subset of entries are determined by one of three techniques, the top n documents, the top n documents that are evenly spaced within a result list, and a random selection of n documents (see, *inter alia*, Mao col. 5, lines 46-55). Such an arrangement differs from that recited in claim 5. In particular, neither Mao nor Shirasaka, whether considered singly or in combination, suggest the recited arrangement for determining an amount of required results and the subsequent increase in such amount as recited in claim 1. Moreover, neither Mao nor Shirasak, whether considered singly or in combination, suggest an arrangement in which missing aggregate values are obtained from each partial server that did not send particular keys using the new value of C to generate supplemental results, and that the C results are merged with the supplemental results at the logical index server.

Accordingly, claim 5 should be allowable.

Claim 11 has been amended to recite: “A method of executing a query in a multiserver computing environment for N sorted results with offset M, the method comprising: initiating a query on each of a plurality of partial index servers; evaluating results of the query in parallel on each of the plurality of partial index servers; sending a predefined number of top partial results from each of the partial index servers to a logical server; merging the sent top partial results from the respective partial index servers by the logical server; determining whether the predefined number is sufficiently large to return results from one or more of the partial index servers for one or more keys; finding deltas for keys missing on one or more of the partial index servers; discarding merged aggregate values below the

predefined number on the logical server; selecting missing aggregate values from the partial index servers having missing keys; and merging all obtained results.” (for support, see, *inter alia*, specification paragraphs 26-35, FIG. 5).

Claim 11 is also allowable for the reasons stated above in connection with claim 5. Furthermore, neither of Mao or Shirasaka, whether considered singly or in combination, suggest: “determining whether the predefined number is sufficiently large to return results from one or more of the partial index servers for one or more keys; finding deltas for keys missing on one or more of the partial index servers; discarding merged aggregate values below the predefined number on the logical server; selecting missing aggregate values from the partial index servers having missing keys; and merging all obtained results.”

Accordingly, claim 11 should also be allowable.

#### Concluding Comments

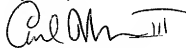
It is believed that all of the pending claims have been addressed in this paper. However, failure to address a specific rejection, issue or comment, does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above are not intended to be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment. Applicant asks that all claims be allowed.

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If there are any questions regarding these amendments and remarks, the Examiner is encouraged to contact the undersigned at the telephone number provided below. The Commissioner is hereby authorized to charge any additional fees that may be due, or credit any overpayment of same, to Deposit Account No. 50-0311, Reference No. 34874-087.

Respectfully submitted,



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